

**ABSTRACT OF THE DISCLOSURE**

- A liquid volume-flow meter suitable for measuring extremely turbulent flow is disclosed.
- 5 The meter comprises a measuring chamber formed as a pipe having a wall of transparent material. This can be a smooth pipe fitted inline with an existing pipe of similar diameter, whereby the detector has minimal effect upon the operation of an existing installation. The meter further comprises an optical velocity array for measuring the speed of liquid flowing within the measuring chamber and an optical area sensor for measuring the area within the
- 10 measuring chamber occupied by liquid flowing within the measuring chamber. The optical area sensor comprises a plurality of arrays including a backscatter reflection array to estimate the height of liquid within the measuring chamber and at least one further correction array to correct the estimation made by the reflection array. Each array comprises an optical emitter and an optical detector that operate through the transparent
- 15 wall of the measuring chamber.